

Patent
42478-6700**IN THE CLAIMS:**

1. (Currently Amended) A time managing apparatus that manages times clocked by a plurality of timer modules in target apparatuses connected to each other on a network, the time managing apparatus comprising:

a presetting information receiving means for receiving, from outside, presetting information which contains as a pair, (i) event start time information that indicates an event start time at which one or more events should be started by one or more target apparatuses on the network, and (ii) a module identifier that identifies, as an output source of a standard time, one of the plurality of timer modules in the target apparatuses, and further contains, for each event, one or more apparatus identifiers of one or more target apparatuses among the target apparatuses on the network, that should execute the event;

a holding means for holding the presetting information received by the presetting information receiving means;

a time requesting means for requesting a timer module, which is identified by the module identifier held by the holding means, to transmit a standard time;

a time receiving means for receiving the standard time, from the timer module requested by the time requesting means, to transmit the standard time;

a judging means for judging whether the event start time is reached, by comparing the standard time received by the time receiving means with the event start time indicated by the event start time information held by the holding means; and

an instructing means for, when the judging means judges that the event start time is reached, identifying the one or more target apparatuses by one or more apparatus identifiers

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held by the holding means and instructing each of the one or more target apparatuses to start executing the one or more events simultaneously.

2-3. (Cancelled)

4. (Previously Presented) The time managing apparatus of claim 1, wherein
the presetting information, received by the information receiving means and held by the holding means, further contains, for each event, event type information indicating an event type, and

when the judging means judges that the event start time is reached, the instructing means transmits pieces of event type information which, held by the holding means, corresponds to the one or more events to each of the one or more target apparatuses having apparatus identifiers corresponding to the one or more events, so that the one or more target apparatuses start executing the one or more events simultaneously.

5. (Currently Amended) The time managing apparatus of claim [[3]] 1 further comprising:

a module identifier storage means for storing module identifiers by correlating the module identifiers with at least one of event type information and apparatus identifiers, the module identifiers being received by the information receiving means together with the presetting information, wherein

if the information receiving means receives at least one of a piece of event type information and an apparatus identifier together with the presetting information, without

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receiving a module identifier, the information receiving means searches the module identifier storage means for a module identifier that correlates with the received piece of event type information and/or apparatus identifier, and if the information receiving means finds such a module identifier, the information receiving means allows the found module identifier to be selected automatically.

6. (Currently Amended) A time managing apparatus that manages times clocked by a plurality of timer modules in target apparatuses connected to each other on a network, the time managing apparatus comprising:

a presetting information receiving means for receiving from outside (a) event start time information that indicates an event start time at which one or more events should be started by one or more target apparatuses on the network, (b) one or more apparatus identifiers of one or more target apparatuses among the target apparatuses on the network that should execute the one or more events, and (c) a piece of management information that corresponds to the event start time and is used to manage a time clocked by a timer module;

a holding means for holding the event start time information, apparatus identifier, and piece of management information received by the presetting information receiving means;

the time output requesting means for requesting the timer module corresponding to the piece of management information held by the holding means to output a standard time;

a time receiving means for receiving the standard time from the timer module, requested by the time output requesting means, to output the standard time;

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a time managing means for managing the standard time, received by the time receiving means, by storing the standard time together with the piece of management information held by the holding means, in correspondence with the timer module;

a presetting information transmitting means for transmitting, the event start time information and the piece of management information held by the holding means, to each of the one or more target apparatuses that are identified by the one or more apparatus identifiers held by the holding means;

a standard time acquisition request receiving means for receiving a standard time acquisition request together with a piece of management information from each of the one or more target apparatuses; [[and]]

a standard time transmitting means for transmitting, to each of the target apparatuses, a standard time that is identified by the piece of management information attached to the standard time acquisition request received by the standard time acquisition request receiving means;

judging means for judging whether the event start time is reached; and

an instructing means for, when the judging means judge the event start time is reached transmitting triggers to one or more target apparatus so that the one or more target apparatus start executing the one or more events simultaneously.

7. (Previously Presented) The time managing apparatus of claim 6, wherein

the presetting information receiving means further receives event type information indicating an event type for each of the one or more events,

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the holding means further holds the event information received by the presetting information receiving means, and

the presetting information transmitting means further transmits the event type information held by the holding means.

8. (Cancelled)

9. (Previously Presented) The time managing apparatus of claim 7 further comprising:

a management information storage means for storing the piece of management information received by the presetting information receiving means, by correlating the piece of management information with at least one of a piece of event type information and two or more apparatus identifiers, wherein

if the presetting information receiving means receives at least one of a piece of event type information and an apparatus identifier, without receiving management information, the presetting information receiving means searches the management information storage means for a piece of management information that correlates with the received piece of event type information and/or apparatus identifier, and if the presetting information receiving means finds such a piece of management information, the presetting information receiving means allows the found piece of management information to be selected automatically.

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10. (Currently Amended) A time managing apparatus that manages times clocked by a plurality of timer modules in apparatuses connected to each other on a network, the time managing apparatus comprising:

a presetting information receiving means for receiving from outside (a) event start time information that indicates an event start time at which one or more events should be started by one or more target apparatuses among the target apparatuses on the network, (b) a module identifier that identifies, as an output source of a standard time, one of the plurality of timer modules in the target apparatuses, (c) event type information indicating an event type for each of the one or more events, and (d) for each event, one or more apparatus identifiers of one or more target apparatuses among the target apparatuses on the network that should execute the one or more events;

a holding means for holding the event start time information, module identifier, event type information, and apparatus identifier received by the presetting information receiving means;

a time output requesting means for requesting the timer module which is identified by the module identifier, held by the holding means, to output a standard time;

a time receiving means for receiving the standard time from the timer module;

[[and]]

a presetting information transmitting means for transmitting the event start time information, event type information, and standard time, held by the holding means, to each of the one or more target apparatuses identified by the one or more apparatus identifiers held by the holding means;

judging means for judging whether the event start time is reached; and

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an instructing means for, when the judging means judge the event start time is reached transmitting triggers to one or more target apparatus so that the one or more target apparatus start executing the one or more events simultaneously.

11. (Previously Presented) The time managing apparatus of claim 10 further comprising:

a module identifier storage means for storing the received module identifier by correlating the module identifier with at least one of a piece of event type information and two or more apparatus identifiers, wherein

if the presetting information receiving means receives at least one of a piece of event type information and an apparatus identifier, without receiving a module identifier, the presetting information receiving means searches the module identifier storage means for a module identifier that correlates with the received piece of event type information and/or apparatus identifier, and if the presetting information receiving means finds such a module identifier, the presetting information receiving means allows the found module identifier to be selected automatically.

12. (Currently Amended) A time managing apparatus that manages times clocked by a plurality of timer modules in target apparatuses connected to each other on a network, the time managing apparatus comprising:

a designation receiving means for receiving designation by a user of a timer module among the plurality of timer modules in the target apparatuses on the network, the timer module being used as a standard timer module for synchronization;

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a time requesting means for requesting the designated timer module to output a standard time;

a time receiving means for receiving the standard time from the requested timer module; [[and]]

a time transmitting means for transmitting the received standard time to the other timer modules among the plurality of timer modules, excluding the timer module that output the standard time, instructing the other timer modules to synchronize times thereof with the transmitted standard time;

judging means for judging whether an event start time is reached; and

an instructing means for, when the judging means judge the event start time is reached transmitting triggers to one or more target apparatus so that the one or more target apparatus start executing the one or more events simultaneously.

13. (Currently Amended) A time managing apparatus that manages times clocked by a plurality of timer modules in target apparatuses connected to each other on a network, the time managing apparatus comprising:

a presetting information receiving means for receiving (a) event start time information that indicates an event start time at which one or more events should be started by two or more apparatuses on the network, (b) a piece of management information, and (c) event type information indicating an event type for each of the one or more events, from a target apparatus among the target apparatuses on the network that vicariously manages standard times clocked by the plurality of timer modules using different pieces of management information assigned to the plurality of timer modules;

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a holding means for holding the received event start time information, piece of management information, and event type information;

a time acquisition request transmitting means for transmitting to the target apparatus, which manages the standard times, a time acquisition request with the received piece of management information attached thereto;

a time receiving means for receiving from the target apparatus, which manages the standard times, a standard time identified by the transmitted piece of management information among the standard times managed by the target apparatus;

a judging means for judging whether the event start time is reached by comparing the received standard time with the event start time indicated by the event start time information held by the holding means; and

an executing means for starting to execute an event that is indicated by the event type information held by the holding means when the judging means judges that the event start time is reached by transmitting triggers to one or more target apparatus so that the one or more target apparatus start executing the one or more events simultaneously.

14. (Currently Amended) A time managing apparatus that manages times clocked by a plurality of timer modules in target apparatuses connected to each other on a network, the time managing apparatus comprising:

a time clocking means for clocking a local time for the time managing apparatus itself;

a presetting information receiving means for receiving (a) event start time information that indicates an event start time at which one or more events should be started by

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two or more target apparatuses on the network, (b) event type information indicating an event type for each of the one or more events, from a target apparatus among the target apparatuses on the network, the presetting information receiving means also continuously receiving a standard time from a time module among the plurality of timer modules in the target apparatuses;

a time difference calculating means for calculating a time difference between the local time received from the time clocking means and the standard time received by the presetting information receiving means;

a holding means for holding the received event start time information and type information and the time difference time calculated by the difference calculating means;

a judging means for continuously judging whether the event start time is reached by continuously receiving the local time from the time clocking means, acquiring a corrected time by correcting the received local time using the time difference held by the holding means, and comparing the acquired corrected time with the event start time indicated by the event start time information held by the holding means; and

an executing means for starting to execute an event that is indicated by the event type information held by the holding means when the judging means judges that the event start time is reached by transmitting triggers to one or more target apparatus so that the one or more target apparatus start executing the one or more events simultaneously.

15. (Currently Amended) A time managing method for a time managing apparatus that manages times clocked by a plurality of timer modules in target apparatuses connected to each other on a network, the time managing apparatus comprising

a recording medium,

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the time managing method comprising:

a presetting information receiving step for receiving, from the outside, presetting

information which contains, as a pair, (i) event start time information that indicates an event start

time at which one or more events should be started by one or more target apparatuses on the

network, and (ii) a module identifier that identifies, as an output source of a standard time, one of

the plurality of timer modules in the target apparatuses, and further contains, for each event, one

or more apparatus identifiers of one or more target apparatuses among the target apparatuses on

the network that should execute the event:

a holding step for holding, in the recording medium, the presetting information

received by the presetting information receiving step;

a time requesting step for requesting a timer module, which is identified by the

module identifier held in the recording medium, to transmit a standard time;

a time receiving step for receiving the standard time, from the timer module

requested by the time requesting step, to transmit the standard time;

a judging step for judging whether the event start time is reached, by comparing

the received standard time with the event start time indicated by the event start time information

held in the recording medium; and

an instructing step responsive to the judging step judging that the event start time

is reached for identifying the one or more target apparatuses by one or more apparatus identifiers

held in the recording medium and instructing each of the one or more target apparatuses to start

executing the one or more events simultaneously.

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16. (Currently Amended) A time managing method for a time managing apparatus that manages times clocked by a plurality of timer modules in target apparatuses connected to each other on a network, the time managing comprising[:] a recording medium, the time managing method comprising:

a presetting information receiving step for receiving from outside (a) event start time information that indicates an event start time at which one or more events should be started by two or more target apparatuses among the target apparatuses on the network, (b) one or more apparatus identifiers of one or more target apparatuses among the target apparatuses on the network that should execute the one or more events and (c) a piece of management information that corresponds to the event start time and is used to manage a time clocked by a time module;

a holding step for holding the event start time information, apparatus identifiers, and piece of management information received by the presetting information receiving step;

a time output requesting step for requesting the timer module corresponding to the piece of management information to output a standard time;

a time receiving step for receiving the standard time from the timer module requested by the time output requesting step to output the standard time;

a time managing step for managing the received standard time by storing the stored time together with the piece of management information, in correspondence with the timer module;

a presetting information transmitting step for transmitting the event start time information and the piece of management information to the one or more target apparatuses that are identified by the one or more apparatus identifiers held in the recording medium;

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a standard time acquisition request receiving step for receiving a standard time acquisition request together with a piece of management information from each of the one or more target apparatuses; [[and]]

a standard time transmitting step for transmitting to each of the target apparatuses a standard time that is identified by the piece of management information attached to the standard time acquisition request received by the standard time acquisition request receiving step;

a judging step for judging when an event start time is reached; and

an instructing step for when the judging step judge the event start time is reached transmitting triggers to one or more target apparatus so that the one or more target apparatus start executing the one or more events simultaneously.

17. (Currently Amended) A time managing method for a time managing apparatus that manages times clocked by a plurality of timer modules in apparatuses connected to each other on a network, the time manager apparatus including a recording medium, the time managing method comprising the steps:

a presetting information receiving step for receiving from outside (a) event start time information that indicates an event start time at which one or more events should be started by one or more target apparatuses among the target apparatuses on the network, (b) a module identifier that identifies, as an output sources of a standard time, of a timer module among the plurality of timer modules in the target apparatuses on the network, (c) event type information indicating an event type for each of the one or more events, and (d) one or more apparatus

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identifiers of one or more target apparatuses among the target apparatuses on the network that should execute the one or more events;

a holding step for holding, in the recording medium, the event start time information, module identifiers, event type information, and apparatus identifiers received by the presetting information receiving step;

a time output requesting step for requesting the timer module which is identified by the module identifier held in the recording medium to output a standard time;

a time receiving step for receiving the standard time from the timer module requested by the time output requesting step to output the standard time; [[and]]

a presetting information transmitting step for transmitting the event start time information, event type information, and standard time, to each of the one or more target apparatuses identified by the one or more apparatus identifiers held in the recording medium;

a judging step for judging whether the event start time is reached; and

an instructing step for, when the judging step judges the event start time is reached transmitting triggers to one or more target apparatus so that the one or more target apparatus start executing the one or more events simultaneously.

18. (Currently Amended) A time managing method for a time managing apparatus that manages times clocked by a plurality of timer modules in apparatuses connected to each other on a network, the time managing method comprising:

a designation receiving step for receiving designation by a user of a timer module among the plurality of timer modules in the target apparatuses on the network, the timer module being used as a standard timer module for synchronization;

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a time requesting step for requesting the designated timer module to output a standard time;

a time receiving step for receiving the standard time from the requested timer module; [[and]]

a time transmitting step for transmitting the received standard time to the other timer modules among the plurality of timer modules excluding the timer module that output the standard time, instructing the other timer modules to synchronize times thereof with the transmitted standard time;

a judging means for judging whether the event start time is reached; and

an instructing step for, when the judging step judges the event start time is reached transmitting triggers to one or more target apparatus so that the one or more target apparatus start executing the one or more events simultaneously.

19. (Currently Amended) A time managing method for a time managing apparatus that manages times clocked by a plurality of timer modules in target apparatuses connected to each other on a network,

the time managing apparatus comprising:

a recording medium, and

the time managing method comprising:

a presetting information receiving step for receiving (a) event start time information that indicates an event start time at which one or more events should be started by two or more target apparatuses on the network, (b) a piece of management information, and (c) event type information indicating an event type for each of the one or more events, from a target

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apparatus among the target apparatuses on the network that vicariously manages the standard times clocked by the plurality of timer modules using different pieces of management information assigned to the plurality of timer modules;

a holding step for holding, in the recording medium, the event start time information, piece of management information, and event type information received by the presetting information receiving step;

a time acquisition request transmitting step for transmitting, to the target apparatus that manages the standard times, a time acquisition request with the received piece of management information attached thereto;

a time receiving step for receiving from the apparatus, which manages the standard times, a standard time identified by the transmitted piece of management information;

a judging step for judging whether the event start time received in the time receiving step is reached by comparing the received standard time with the event start time indicated by the event start time information; and

an executing step for starting to execute an event that is indicated by the event type information when the judging step judges that the event start time is reached by transmitting triggers to one or more target apparatus so that the one or more target apparatus start executing the one or more events simultaneously.

20. (Currently Amended) A time managing method for a time managing apparatus that manages times clocked by a plurality of timer modules in target apparatuses connected to each other on a network, the time managing apparatus including a recording medium and

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a time clocking means for clocking a local time for the time managing apparatus itself,

the time managing method comprising:

a presetting information receiving step for receiving (a) event start time information that indicates an event start time at which one or more events should be started by two or more target apparatuses on the network, (b) event type information indicating an event type for each of the one or more events, from a target apparatus among the target apparatuses on the network, the presetting information receiving step also continuously receiving a standard time from a time module among the plurality of timer modules in the target apparatuses on the network;

a time difference calculating step for calculating a time difference between the local time received from the time clocking means and the standard time received by the presetting information receiving step;

a holding step for holding in the receiving medium, the event start time information and type information received in the presetting information receiving step and the time difference calculated by the difference calculating step;

a judging step for continuously judging whether the event start time is reached by receiving the local time from the time clocking step, acquiring a corrected time by connecting the received local time using the time difference held in the recording medium, and comparing the acquired corrected time with the event start time indicated by the event start time information; and

an executing step for starting to execute an event that is indicated by the event type information held in the recording medium when the judging step judges that the event start

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time is reached by transmitting triggers to one or more target apparatus so that the one or more target apparatus start executing the one or more events simultaneously.

21-26. (Cancelled)

27. (Currently Amended) An apparatus comprising a machine readable medium containing instructions which, when executed by a machine, cause the machine to perform operations comprising:

receiving presetting information, which contains, as a pair, (i) event start time information that indicates an event start time at which one or more events should be started by two or more apparatuses on the network and (ii) a module identifier of the timer module and for each event, an apparatus identifier of an apparatus that should execute the event, from outside;

holding the presetting information received;

requesting a timer module, which is identified by the module identifier being held to transmit a standard time;

receiving the standard time from the timer module requested to transmit the standard time;

judging whether the event start time is reached, by comparing the standard time received with the event start time indicated by the event start time information; and

responsive to the judging step judging that the event start time is reached, identifying the two or more apparatuses by apparatus identifiers being held and instructing the two or more apparatuses to start executing the one or more events simultaneously.

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28. (Currently Amended) An apparatus comprising a machine readable medium containing instructions which, when executed by a machine, cause the machine to perform operations comprising:

receiving from outside (a) event start time information that indicates an event start time at which one or more events should be started by two or more apparatuses on the network, (b) apparatus identifiers of apparatuses that should execute the one or more events, and (c) a piece of management information that corresponds to the event start time and is used to manage a time clocked by a timer module;

holding the event start time information, apparatus identifiers, and piece of management information received;

requesting the timer module corresponding to the piece of management information being held;

receiving the standard time from the timer module requested to output the standard time;

managing the standard time received by storing the standard time together with the piece of management information being held, in correspondence with the timer module;

transmitting the event start time information and the piece of management information being held to the apparatuses that are identified by the apparatus identifiers being held;

receiving a standard time acquisition request together with a piece of management information from each of the apparatuses; [[and]]

transmitting, to each of the apparatuses a standard time that is identified by the piece of management information attached to the standard time acquisition request;

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judging whether the event start time is reached; and

instructing, when the event start time is reached, an execution of one or more target apparatus so that the one or more target apparatus start executing the one or more events simultaneously.

29. (Currently Amended) An apparatus comprising a machine readable medium containing instructions which, when executed by a machine, cause the machine to perform operations comprising:

receiving from outside (a) event start time information that indicates an event start time at which one or more events should be started by two or more apparatuses on the network, (b) a module identifier of a timer module, (c) event type information indicating an event type for each of the one or more events, and (d) apparatus identifiers of apparatuses that should execute the one or more events;

holding the event start time information, module identifier, event type information, and apparatus identifiers received;

requesting the timer module, which is identified by the module identifier being held to output a standard time;

receiving the standard time from the timer module; [[and]]

transmitting the event start time information, event type information, and standard time being held to the apparatuses identified by the apparatus identifiers being held;

judging whether the event start time is reached; and

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an instructing, when event start time is reached, transmitting triggers to two or more target apparatus so that the two or more target apparatus start executing the two or more events simultaneously.

30. (Currently Amended) An apparatus comprising a machine readable medium containing instructions which, when executed by a machine, cause the machine to perform operations comprising:

receiving designation by a user of a timer module among [[the]] a plurality of timer modules, of the timer module to be used as a standard timer module for synchronization to enable a determination of an event start time at which one or more events should be started by two or more target apparatuses on a network;

requesting the designated timer module to output a standard time;

receiving the standard time from the requested timer module; [[and]]

transmitting the received standard time to the other timer modules among the plurality of timer modules excluding the timer module that output the standard time, and instructing the other timer modules to synchronize times thereof with the transmitted standard time;

judging whether the event start time is reached; and

instructing, when the judging step judges the event start time is reached, a transmission of trigger instructions to two or more target apparatus so that the two or more target apparatus start executing the two or more events simultaneously.

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31. (Currently Amended) An apparatus comprising a machine readable medium containing instructions which, when executed by a machine, cause the machine to perform operations comprising:

receiving (a) event start time information that indicates an event start time at which one or more events should be started by two or more apparatuses on the network, (b) a piece of management information, and (c) event type information indicating an event type for each of the one or more events, from an apparatus that vicariously manages the times clocked by the plurality of timer modules using different pieces of management information assigned to the plurality of timer modules;

holding the received event start time information, piece of management information, and event type information;

transmitting a time acquisition request with the received piece of management information attached thereto;

receiving a standard time identified by the transmitted piece of management information;

judging whether the event start time is reached by comparing the received standard time with the event start time indicated by the event start time information being held; and

starting to execute an event that is indicated by the event type information being held when the judging means judges that the event start time is reached so that the two or more target apparatus that are to execute the event start executing the events simultaneously.

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32. (Currently Amended) An apparatus comprising a machine readable medium containing instructions which, when executed by a machine, cause the machine to perform operations comprising:

clocking a local time for the time managing apparatus;

receiving (a) event start time information that indicates an event start time at which one or more events should be started by two or more apparatuses on the network, (b) event type information indicating an event type for each of the one or more events, from an apparatus on the network, the presetting information receiving means also continuously receiving a standard time from a time module;

calculating a time difference between the local time and the standard time;

holding the received event start time information and event type information and the calculated time difference time;

continuously judging whether the event start time is reached by continuously receiving the local time, acquiring a corrected time by correcting the received local time using the time difference being held, and comparing the acquired corrected time with the event start time indicated by the event start time information being held; and starting to execute an event that is indicated by the event type information being held when it has been judged that the event start time is reached; and

starting to execute an event that is indicated by the event type information being held when the judging determines the event start time is reached so that the two or more apparatus that are to execute the event start executing the events simultaneously.

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